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RR-0822

Third Year B. Sc. Examination

March / April – 2010

Electronics : Paper - IX

(Measurement & Instrumentation)

Time : **3** Hours] [Total Marks : **70**

Instructions :

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **T. Y. B. Sc.**

Name of the Subject :

☛ **ELECTRONICS : 9**

☛ Subject Code No. : **0 8 2 2** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

1 Answer in brief : **14**

(a) Define deflection sensitivity and deflection factor of a CRT.

(b) Define sinusoidal transfer function.

(c) What is the resolution of $4\frac{1}{2}$ digit display on 1V and 10V ranges ?

(d) List different types of DVM.

(e) What is impedance matching ? Why is it needed ?

(f) What is the principle of operation of digital frequency meter ?

(g) What do you mean by half split method in troubleshooting ?

2 (a) Explain generalised mathematical model of instrumentation system. **9+5**

(b) What is a zero order system ? Explain with the help of one example.

OR

2 (a) Explain different types of inputs for an instrumentation system. Also discuss the two methods of correction for these inputs. **9+5**

(b) Three resistances have the following ratings :

$$R_1 = 35\ \Omega \pm 5\%,\ R_2 = 75\ \Omega \pm 5\%,\ R_3 = 50\ \Omega \pm 5\%$$

Determine the limiting errors in percentage when resistances are connected in series.

3 (a) Derive the equation for time response of a first order system when subjected to (i) Unit step input (ii) Unit ramp input. Draw the response curves and find the steady state error in each case. **9+5**

(b) Explain different stages of preventive and corrective maintenance.

OR

3 (a) Describe the circuit of a square wave generator which generates squares, triangular and sine wave shapes. **9+5**

(b) The Lissajous pattern on a CRO is stationary and has give horizontal and two vertical tangencies. Frequency of horizontal input is 10 kHz. Determine the frequency of vertical input.

4 (a) Draw the circuit diagram and explain the working of a heterodyne type wave analyser. **9+5**

(b) What are the common faults in an inductor ? How will you test an inductance of low Q and an inductance of high Q ?

OR

4 (a) Describe with neat sketches the following types of primary detecting elements : **9+5**

(i) C' Type Bourdon tube

(ii) Bellows.

(b) What is a LVDT ? Explain it in detail. Also give its applications.

5 Write short notes on : (any **two**) **14**

(a) Harmonic distortion analyser

(b) Lissajous figures

(c) Digital pressure transducer

(d) DFM.
